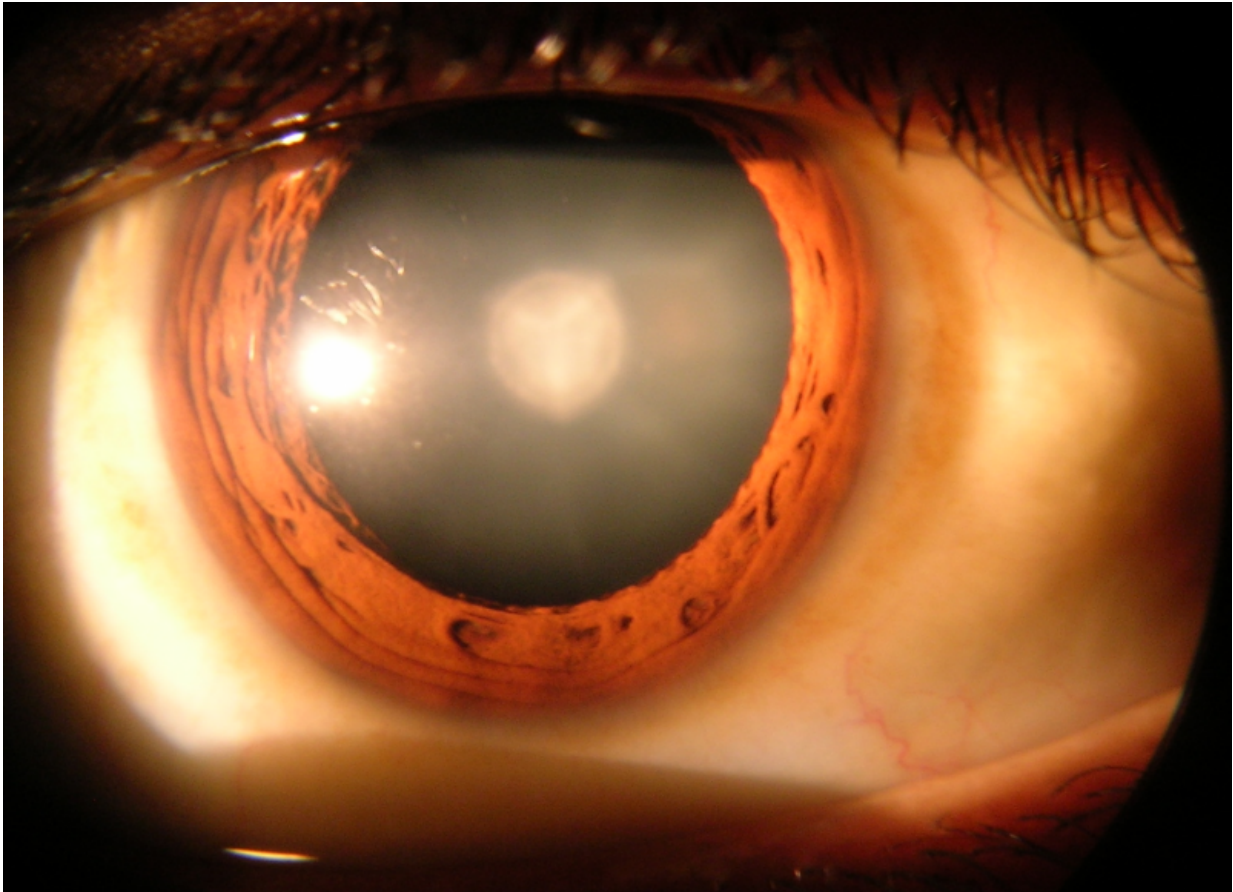


# Preventing secondary cataract

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Cataract in human eye. Credit: Wikipedia.

Scientists may have found a way to prevent complications from surgery to treat cataract, the world's leading cause of blindness. The study was part-funded by eye research charity Fight for Sight and is published by a

research team at the University of East Anglia (UEA) in the open access journal *Scientific Reports*.

It's estimated that by the year 2020, 32 million people will need cataract surgery. Cataracts develop as we age, such that the eye's [lens](#) turns from clear to cloudy.

Surgery works well to restore vision. Natural lens cells are removed from the inside of the lens, which leaves an outer casing called the 'capsular bag' that can house a clear, artificial lens. The capsular bag effectively 'shrink-wraps' the new lens and holds it in place.

However, a few natural lens cells always remain after surgery. In time the eye's wound-healing response leads the cells to spread across the underside of the artificial lens. This interferes with vision, causing what's known as 'posterior capsule opacification' or secondary cataract.

"Secondary visual loss responds well to treatment with laser surgery," says Dr Michael Wormstone, from UEA's School of Biological Sciences, who led the study. "But as life-expectancy increases, the problems of cataract and posterior capsule opacification will become even greater in terms of both patient well-being and economic burden. It's essential that we find better ways to manage the condition in future."

Newer artificial lenses are being designed to be placed into a capsular bag that stays open, instead of shrink-wrapping closed. The thinking is that if fluid in the eye (aqueous humour) can flow around the [artificial lens](#), it will dilute and wash away the cell-signalling molecules that encourage re-growth.

In this study, the researchers took a 2-pronged approach, using human cells and tissue. They first tested the idea that diluting [growth factor](#) can prevent cells invading the posterior capsule. They also aimed to

understand more about which growth factors drive the process with a view to developing a future drug treatment.

"Our results show that reducing the amount of growth factor that's available around the [intraocular lens](#) significantly impedes cell invasion and adds to the evidence in favour of open-bag cataract surgery," continues Dr Wormstone. "Moreover, we found that vascular endothelial growth factor (VEGF) plays an important role in cell growth and survival. Therefore we believe that anti-VEGF treatment is a logical target for new drug treatments that could help enhance the effect of better lens design and placement, to prevent secondary cataract."

"These are encouraging results, with research to develop new intraocular lenses that incorporate anti-VEGF treatment into their design as a potential next step," says Dr Dolores M Conroy, Fight for Sight's Director of Research. "Whether this will work depends on many factors including the safety of anti-VEGF treatment in this part of the eye. However its current use as a treatment to block new blood vessel growth in the wet form of age-related macular degeneration means there is already a body of research from which we can perhaps draw useful insights.

"Reducing the need for secondary [cataract surgery](#) is a highly important goal and indeed, preventing PCO was identified as a high priority by patients in the Sight Loss and Vision Priority Setting Partnership – a consultation to set priorities for eye research."

Follow-up work from the group will be presented at the Association for Research in Vision and Ophthalmology annual meeting (ARVO 2016) which takes place in Seattle from 1-5 May.

**More information:** Eldred, J. A. et al. Growth factor restriction impedes progression of wound healing following cataract surgery:

identification of VEGF as a putative therapeutic target. *Sci. Rep.* 6, 24453; [DOI: 10.1038/srep24453](https://doi.org/10.1038/srep24453) (2016).

Provided by Fight for Sight

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